THE CLAIMS

We claim,

1. An implant composition for stimulating bone growth, comprising:

(a) a calcium sulfate compound,

(b) polymer containing particles, and

(c) a setting agent for setting said calcium sulfate compound and said polymer containing particles into a heterogeneous solid composition,

wherein upon setting, said calcium sulfate compound forms a matrix and said polymer containing particles are settled within said matrix.

2. The implant composition of Claim 1, wherein a rate of resorption of said implant composition in a recipient site is in a range from about four weeks to about twenty eight weeks.

3. The implant composition of Claim 1, wherein said matrix and said polymer containing particles resorb at different rates in a recipient site, and resorption of said polymer containing particles being slower.

4. The implant composition of Claim 1, wherein said calcium sulfate compound is calcium sulfate hemihydrate.

5. The implant composition of Claim 1, wherein said setting agent is selected from the group consisting of water, an alkaline metal salt solution, and a potassium salt solution.

6. The implant composition of Claim 1, wherein said polymer containing particles comprises:

(a) a calcium sulfate compound, and

(b) at least one resorbable polymer.

7. The implant composition of Claim 6, wherein size of said polymer containing particles is more than 20 μm in diameter.

8. The implant composition of Claim 6, wherein said calcium sulfate compound in said polymer containing particles is selected from the group consisting of calcium sulfate dihydrate, calcium sulfate hemihydrate, and mixture thereof.

9. The implant composition of Claim 6, wherein said resorbable polymer is mixed with said calcium sulfate compound of said particles.

10. The implant composition of Claim 6, wherein said said calcium sulfate compound of said particles is coated with a resorbable polymer coating.

11. The implant composition of Claim 10, wherein thickness of said resorbable polymer coating is from about 2 μm to about 50 μm.

12. The implant composition of Claim 6, wherein said resorbable polymer is aliphatic polyesters of alpha-hydroxy acid derivatives.

13. The implant composition of Claim 12, wherein said resorbable polymer is selected from the group consisting of polyactides, polyglycolides, polydioxanone, and poly ε-caprolactone.

14. The implant composition of Claim 12, wherein said resorbable polymer is polyactides.

15. The implant composition of Claim 6, wherein said resorbable polymer is amino acid derived polymers selected from the group consisting of poly (DTE carbonates) and their derivatives.

16. The implant composition of Claim 6, wherein said resorbable polymer is selected from the group consisting of hydrophobic polymers, carnuba waxes and their derivatives, water soluble polymers, polyvinyl alcohols, and therapeutic polymers containing salicylates.

17. The method of Claim 6, wherein the amount of said resorbable polymer in said polymer containing particle is in a range from about 0.1% to about 50% (w/w).

18. A kit of implant materials for bone augmentation and bone defect reparation comprising:

(a) dry powder of a calcium sulfate compound, and

(b) polymer containing particles.

19. The kit of implant materials of Claim 18, wherein said calcium sulfate compound is calcium sulfate hemihydrate.

20. The kit of implant materials of Claim 18, wherein said polymer containing particles comprises:

(a) a calcium sulfate compound, and

(b) at least one resorbable polymer.

21. The kit of implant materials of Claim 20, wherein size of said polymer containing particles is more than 20 μm in diameter.

22. The kit of implant materials of Claim 20, wherein said calcium sulfate compound in said polymer containing particles is selected from the group consisting of calcium sulfate dihydrate, calcium sulfate hemihydrate, and mixture thereof.

23. The kit of implant materials of Claim 20, wherein said resorbable polymer is mixed with said calcium sulfate compound of said particles.

24. The kit of implant materials of Claim 20, wherein said calcium sulfate compound of said particles is coated with a resorbable polymer coating.

25. The kit of implant materials of Claim 24, wherein thickness of said resorbable polymer coating is from about 2 μm to about 50 μm.

26. The kit of implant materials of Claim 20, wherein said resorbable polymer is aliphatic polyesters of alpha-hydroxy acid derivatives.

27. The kit of implant materials of Claim 26, wherein said resorbable polymer is selected from the group consisting of polyactides, polyglycolides, polydioxanone, and poly ε-caprolactone.

28. The kit of implant materials of Claim 26, wherein said resorbable polymer is polyactides.

29. The kit of implant materials of Claim 20, wherein said resorbable polymer is amino acid derived polymers selected from the group consisting of poly (DTE carbonates) and their derivatives.

30. The kit of implant materials of Claim 20, wherein said resorbable polymer is selected from the group consisting of hydrophobic polymers, carnuba waxes and their derivatives, water soluble polymers, polyvinyl alcohols, and therapeutic polymers containing salicylates.

31. The kit of implant materials of Claim 20, wherein the amount of said resorbable polymer in said polymer containing particle is in a range from about 0.1% to about 30% (w/w).

32. The kit of implant materials of Claim 18, wherein said kit comprises two different types of polymer containing particles that resorb at different rates in a recipient site.

33. The kit of implant materials of Claim 18 further comprising a setting agent, packed in a container.

34. The kit of implant materials of Claim 33, wherein said setting agent is selected from the group consisting of water, an alkaline metal salt solution, and a potassium salt solution.

35. The kit of implant materials of Claim 18 further comprising instructions on how to use the kit.

36. A method for bone augmentation and bone defect reparation comprising the steps of:

(a) mixing a calcium sulfate compound and polymer containing particles with a setting agent into a mixture,

(b) applying said mixture, and

(c) setting said mixture into a heterogeneous solid composition, wherein upon setting, said calcium sulfate compound forms a matrix and said polymer containing particles settled within said matrix;

wherein said heterogeneous solid composition resorbs at a controlled rate in a recipient site for stimulating bone growth.

37. The method of Claim 36, wherein applying said mixture is filling a recipient site with said mixture.

38. The method of Claim 36, wherein applying said mixture is coating said mixture on a surface of a surgical implant prior to introducing said surgical implant into said recipient site.

39. The method of Claim 36, wherein said setting agent controls a speed of setting said mixture into a heterogeneous solid composition.

40. The method of Claim 39, wherein said setting agent is selected from the group consisting of water, an alkaline metal salt solution, and a potassium salt solution.

41. The method of Claim 36, wherein said polymer containing particles are two different types of polymer containing particles that resorb at different rates in a recipient site.